UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/704,898	11/02/2000	Firas Abi-Nassif	12144-004001	4528

26161 7590 03/07/2007
FISH & RICHARDSON PC
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
HO, CHUONG T	
ART UNIT	PAPER NUMBER
2616	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/704,898	ABI-NASSIF ET AL.	
	Examiner	Art Unit	
	CHUONG T. HO	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. The amendment filed 12/08/06 have been entered and made of record.

2. Applicant's arguments with respect to claims 1-33 have been considered but are moot in view of the new ground(s) of rejection.

3. Claims 1-33 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 2-4, 5, 6-8, 26, are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. (U.S.Patent No. 6,865,185 B1) in view of Patel (U.S.Patent No. 6,850,764 B1), and in further view of Haddock et al. (U.S.Patent No. 6,104,700).

In the claims 1, 26, Patel et al. discloses inserting labels or tags in fron of each data packet indicating the FEC which is based on the commonability of flow characteristics. Such lablels or tags enable the enforcement of QoS treatments (see col. 3, lines 62-65); The system for queing traffic in a wireless network includes receiving a stream of packets for transmission in the wireless network..... Each packet is queued in an assigned vrtual group for transmission in the wireless network (see abstract); comprising:

- Receiving data packets at a communication node; associating each of the received data packets with one of a set of different service classes; transmitting packets corresponding to the received packets to recipients based on the service class associated with each of the received data packets corresponding to the outbound packets (see col. 3, lines 62-65, abstract).
- Controlling the order in which packets are transmitted based on the transmission rate (Guaranteed Rate) and the service class (QoS Class) associated with each of the received data packets corresponding to the outbound packets (see col. 1, lines 42-45).

However, Patel et al. (6865185) is silent disclosing associating each of the received data packet with a forward link transmission rate associated with each of the received data packets corresponding to the outbound packets.

Patel (6850764) discloses associating each of the received data packet with a forward link transmission rate (see figure 4, figure 2, col. 7, lines 63-67, the flow classifier 90 marks the incoming packets into various classes or service types. The per-flow remarking engine 92 remarks the packets based on the per-flow queue statistics 94, the QoS policies and service level agreements 62) (see col. 6, lines 57-58, the QoS policies and service level agreement information 62 provide information on service level agreement and QoS policies of the business and consumers for the wireless network 10) (see col. 6, lines 63-64, Provision of the policies and agreement information 62 and 64 allows contractual obligations to be accounted for in allocated bandwidth within the wireless network 10);

Controlling an order in which the outbound packets are transmitted to the recipients based on the forward link transmission rate associated with each of the received data packets corresponding to the outbound packets (see figure 11, col. 7, lines 63-67, col. 13, lines 20-30, the allocation engine 232 governs the remarking process)

Both Patel (6865185) and Patel (6850764) disclose the different service class of the packets. Patel (6850764) recognizes controlling an order in which the outbound packets are transmitted to the recipients based on rates of transmission of the outbound packets. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Patel (6865185) with the teaching of Patel (6850764) to associate each of the received data packets with one of a set of different service classes in order to control transmitting packet to the recipient based on QoS, transmission rate. Therefore, the combined system would have been reduced the delay time in the processing packets.

However, the combined system (Patel (6865185) – Patel (6850764)) is silent to disclosing Controlling an order in which the outbound packets are transmitted to the recipients based on a degree to which an average forwarding percentage for the service class associated with each of the received data packets corresponding to the outbound packets falls below a minimum average forwarding percentage rate assigned to the respective service class.

Haddock et al. discloses Controlling an order in which the outbound packets are transmitted to the recipients based on a degree to which an average forwarding percentage for the service class associated with each of the received data packets

corresponding to the outbound packets falls below a minimum average forwarding percentage rate assigned to the respective service class (col. 8, lines 10-14, minimum bandwidth) (col. 10, lines 15-20, those QoS queues that have a current bandwidth that is below their minimum bandwidth).

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined system (Patel (6865185) – Patel (6850764)) with the teaching of Haddock to control an order in which the outbound packets are transmitted to the recipients based on a degree to which an average forwarding percentage for the service class associated with each of the received data packets corresponding to the outbound packets falls below a minimum average forwarding percentage rate assigned to the respective service class in order to employ weighted faire queuing delivery schedule which shares available bandwidth.

5. In the claim 2, Patel et al. (6865185) discloses the transmitted packets comprise physical layer packets (see col. 2, lines 5-45).

6. In the claim 3, Patel (6865185) discloses the rates of transmission are controlled based on a time-division multiplexing algorithm (see col. 10, lines 11-18).

7. In the claim 4, Patel (6865185) discloses the node comprises a radio node of communication protocol (see figure 1, col. 10, lines 10-45).

8. In the claim 6, Patel et al. (6865185) discloses the different classes of service conform to a differentiated services architecture (see col. 3, lines 62-65, abstract).

9. In the claim 7, Patel et al. (6865185) discloses the differentiated service architecture comprises DiffServ (see col. 3, lines 62-65, abstract).

10. In the claim 8, Patel et al. (6865185) discloses the service classes comprises at least one expedited forwarding class and at least one assured forward class (see col. 10, lines 12-18).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 5, 9, 10, 11, 12, 28, 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined system (Patel (6865185) – Patel (6850764) - Haddock) in view of Tiedemann, Jr. et al. (U.S.Patent No. 6,567,420 B1).

In the claim 5, the combined system (Patel (6865185) – Patel (6850764) - Haddock) discloses the limitations of claim 4 above.

However, (Patel (6865185) – Patel (6850764) - Haddock) are silent to disclosing high data rate.

(Tiedemann, Jr. et al. discloses high data rate (see col. 4, lines 65-67, col. 7, lines 1-5).

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined system (Patel (6865185) – Patel (6850764) - Haddock) with the teaching of Tiedmann to provide high data rate in order to employing a variable data rate transmission scheme.

13. In the claim 9, Tiedemann, Jr. et al. discloses receiving a user-defined minimum average forwarding percentage rate for at least one of the different service classes (see col. 7, lines 1-5).

14. In the claim 10, Tiedemann, Jr. et al. discloses the percentage comprises a percentage of the total bandwidth of a link on which the packets are transmitted (see col. 2, lines 57-67).

15. In the claim 11, Tiedemann, Jr. et al. discloses the transmission rates are sent by the recipients (see col. 7, lines 1-5)

16. In the claim 12, Tiedemann, Jr. et al. discloses the transmission rates are sent by the recipients using a feedback channel to the node (see col. 8, lines 1-8).

17. In the claim 28, Tiedemann, Jr. et al. discloses the rate of transmission of each of the outbound packets varies based on a quality of a channel that serves the recipient of the outbound packet (see col. 8, lines 1-8).

18. In the claim 29, Tiedemann, Jr. et al. discloses the rate of transmission of each of the outbound packets varies based on a quality of a channel that serves the recipient of the outbound packet (see col. 8, lines 1-8).

Claim Rejections - 35 USC § 103

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negatived by the manner in which the invention was made.

20. Claims 13, 14-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined system (Patel (6865185) – Patel (6850764) - Haddock) in view of Jalali. et al. (Data throughput of CDMA-HDR).

In the claim 13, the combined system (Patel (6865185) – Patel (6850764) - Haddock) discloses the limitations of claim 1 above.

However, the combined system (Patel (6865185) – Patel (6850764) - Haddock) is silent to disclosing an order of transmission of the packets is controlled by two-level scheduling including a class level in which ordering is determined among the classes of service and a recipient level in which ordering is determined among the recipients associated with each class

Jalali et al. discloses an order of transmission of the packets is controlled by two-level scheduling including a class level in which ordering is determined among the classes of service and a recipient level in which ordering is determined among the recipients associated with each class (see page. 1856, col. 1, lines 34-50).

Both the combined system (Patel (6865185) – Patel (6850764) - Haddock) and Jalali et al. disclose the class of service of packets. Jalali recognizes an order of transmission of the packets is controlled by two-level scheduling including a class level in which ordering is determined among the classes of service and a recipient level in which ordering is determined among the recipients associated with each class (see page. 1856, col. 1, lines 34-50). Thus, it would have been obvious to one of ordinary

skill in the art at the time of the invention to modify the combined system (Patel (6865185) – Patel (6850764) - Haddock) with the teaching of Jalali to provide two-level scheduling including a class level in which ordering is determined among the classes of service and a recipient level in which ordering is determined among the recipients associated with each class in order to been enable the scheduler to determine the order to transmit data packets to recipient based on transmission rate and class of service of data packet.

21. In the claim 14, Jalali et al. discloses the recipient level uses the Qualcomm algorithm (see page 1856, col. 1, lines 34-50).

22. In the claim 15, Jalali et al. discloses the class level scheduling is based on at least one of the following for each of the classes: a configured minimum average forwarding rate percentage for the class, an actual forwarding rate percentage recently received by the class, and a channel quality of the recipients that belong to the class and are selected to receive service by the recipient level scheduling (see page 1856, col. 2, lines 34-50).

23. In the claim 16, Jalali et al. discloses the class level scheduling is done over a predetermined length window of time slots (see page 1856, col. 1, lines 34-50).

24. In the claim 17, Jalali et al. discloses the class level scheduling includes a weighted round robin scheduling algorithm in which the weights corresponds to channel quality of the recipient belonging to the respective classes (see page 1856, col. 2, lines 34-50).

25. In the claim 18, Jalali et al. discloses the class level scheduling is based at least in part on a planned selection at the recipient level within each class (see page 1856, col. 1, lines 34-50).

26. In the claim 19, Jalali et al. discloses the class level scheduling is based on a metric scaled by different scaling factors for different service classes (see page 1856, col. 2, lines 34-50).

27. In the claim 20, Jalali et al. discloses the scaling factor for all service classes are adaptively adjust to meet the MAFRP for the service classes (see page 1856, col. 2, lines 34-50).

28. In the claim 21, Jalali et al. discloses the class level scheduling is based on a metric which is adaptively adjusted to meet the MAFRP for the service classes (see page 1856, col. 2, lines 34-50.

29. In the claim 22, Jalali et al. discloses the class level scheduling selects a class from among a subset of the classes (see page 1856, col. 1, lines 34-50).

30. In the claims 23, 25, Jalali et al. discloses the member of the subset of classes are determined by pre-assigned schedule times (see page 1856, col. 1, lines 34-50).

31. In the claim 24, Jalali et al. discloses the recipient level scheduling selects a recipient from among a subset of the recipients (see page 1856, col. 1, lines 34-50).

Claim Rejections - 35 USC § 103

32. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the

subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

33. Claims 27, 30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patel et al. (U.S.Patent No. 6,865,185 B1) in view of Haddock et al. (U.S.Patent No. 6,104,700), and in further view of Solyar et al. (6,590,890 B1).

In the claim 27, Patel et al. discloses inserting labels or tags in fron of each data packet indicating the FEC which is based on the commonability of flow characteristics. Such lablels or tags enable the enforcement of QoS treatments (see col. 3, lines 62-65); The system for queing traffic in a wireless network includes receiving a stream of packets for transmission in the wireless network..... Each packet is queued in an assigned vrtual group for transmission in the wireless network (see abstract); comprising:

- Receiving data packets at a communication node; associating each of the received data packets with one of a set of different service classes; transmitting packets corresponding to the received packets to recipients based on the service class associated with each of the received data packets corresponding to the outbound packets (see col. 3, lines 62-65, abstract).
- Controlling the order in which packets are transmitted based on the transmission rate (Guaranteed Rate) and the service class (QoS Class) of the packets (see col. 14, lines 1-2, the flow specifications include peak rate, subscribed rate, conformance level, and maximum delay) (see col. 1, lines 42-43);

- Scheduling packet for transmission among distinct classes based on the receiving values (rates or bandwidths), (see col. 19, lines 27-30, in the wireless 10, congestion results when the air bandwidth is depleted. In addition, conditions similar to congestion occur when the air link between the network and the mobile end users degrade due to excessive interference or due to insufficient coverage) (see col. 20, the policy information such as the class of the flows and their QoS policies is used with the available bandwidth to determine the congestion control parameter) (Quality of Service (QoS) over the air).

However, Patel et al. is silent to disclosing receiving from a network operator values representing minimum forwarding rate performance for each of more than one distinct classes of service associated with transmission of packets from a radio node of a network to recipients.

Haddock et al. discloses receiving from a network operator values representing minimum forwarding rate performance for each of more than one distinct classes of service associated with transmission of packets from a radio node of a network to recipients; and minimum forward performance for each of the classes (col. 3, lines 4-5, The QoS queues are divided into two groups based upon their respective bandwidth metrics and their respective minimum bandwidth requirements).

Both Patel, and Haddock disclose to minimize congestion within the communication network. Haddock recognizes receiving from a network operator values representing minimum forwarding rate performance for each of more than one distinct classes of service associated with transmission of packets from a radio node of a network to

recipients. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Patel with the teaching of Haddock to represent receiving from a network operator values representing minimum forwarding rate performance for each of more than one distinct classes of service associated with transmission of packets from a radio node of a network to recipients in order to minimize congestion within the communications network.

However, the combined system (Patel – Haddock) is silent to disclosing scheduling packet transmission based on quality of an air link channel that serves the recipient when the packet is to be transmitted and the minimum forwarding performance for each of the classes.

Stolyar et al. discloses the scheduling being based on a quality of an air-link channel that serves the recipient when the packet is to be transmitted (col. 4, lines 38-39, the mobile stations to send periodic signal to the base station contain indications of channel quality) (col. 5, lines 47-53, Thus, users who have contracted for different classes of service will, in fact, receive different levels of QoS performance. The results of numerical simulations in which these settings are adopted is presented in the Example section, below. In the simulations, generally good QoS performance was observed, although some preferential treatment of the users having better channel quality (i.e., lower weights)

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined system (Patel – Haddock) with the teaching of Stolyar to schedule packets based on a quality of an air-link channel that serves the recipient

when the packet is to be transmitted in order to provide queue stability and probabilistically bounded delay even in the presence of such fluctuation. The combined system would have been enable to guarantee bandwidth requirement on the air link channel.

34. In the claim 30, Haddock et al. discloses the percentage comprises a percentage of a total bandwidth of a link on which the packets are transmitted (see col. 8, lines 10-15, the scheduler can guarantee a minimum percentage of bandwidth to different traffic class).

35. In the claim 31, Haddock et al. discloses controlling an order in which the packets are transmitted to the recipients based on rates of transmission and classes of service of the packets (see col. 8, lines 10-15, the scheduler can guarantee a minimum percentage of bandwidth to different traffic class).

36. In the claim 32, Patel discloses the order in which the packets are transmitted is controlled two level scheduling including a class level in which ordering is determined among the classes of services and a recipient level (virtual group) in which ordering is determined among the recipients associated with each class (see col. 10, lines 12-20).

37. In the claim 33, Patel discloses the limitations of claim 27 above.

However, Patel is silent to disclosing the packets are schedule for transmission based on at least one of the following for each of the classes: a configured minimum average forwarding rate percentage for the class, an actual forwarding rate percentage recently received by the class, and a channel quality for the recipient that belong to the class and are selected to receive service by the recipient level scheduling.

Haddock et al. discloses the packets are schedule for transmission based on at least one of the following for each of the classes: a configured minimum average forwarding rate percentage for the class, an actual forwarding rate percentage recently received by the class, and a channel quality for the recipient that belong to the class and are selected to receive service by the recipient level scheduling (see col. 8, lines 10-15, the scheduler can guarantee a minimum percentage of bandwidth to different traffic class).

Both Patel, and Haddock disclose to minimize congestion within the communication network. Haddock recognizes the packets are schedule for transmission based on at least one of the following for each of the classes: a configured minimum average forwarding rate percentage for the class, an actual forwarding rate percentage recently received by the class, and a channel quality for the recipient that belong to the class and are selected to receive service by the recipient level scheduling. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Patel with the teaching of Haddock to provide the packets are schedule for transmission based on at least one of the following for each of the classes: a configured minimum average forwarding rate percentage for the class, an actual forwarding rate percentage recently received by the class, and a channel quality for the recipient that belong to the class and are selected to receive service by the recipient level scheduling in order to minimize congestion within the communications network.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHUONG T. HO whose telephone number is (571) 272-3133. The examiner can normally be reached on 8:00 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

03/01/07

HUY D. VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600